

REMARKS

Election/Restriction

The election of Claims 1-12 and 18-26 is hereby affirmed.

Double Patenting

Claims 1-2, 4, 6, 8, 10, 12, 18 and 21 were rejected for obviousness-type double patenting over Claims 1-3 of U.S. patent no. 6,427,991. Claims 3, 5, 7, 9, 11, 19-20 and 22-23 were rejected for obviousness-type double patenting over Claims 1-3 of U.S. patent no. 6,427,991 in view of Siniaguine (U.S. patent no. 6,139,678). A terminal disclaimer is enclosed herewith for U.S. patent no. 6,427,991.

Claim Rejections – 35 U.S.C. 103

Claims 1, 2, 8, 10, 12 and 21 were rejected under 35 U.S.C. 103 over Ito Kunio et al., JP 57045233 (“Kunio” below).

Claim 1 recites an article holder with vortex chambers, and states:

a combination of the first vortex chamber with all of the gas inlet and outlet passages terminating at the first vortex chamber is not geometrically identical to a combination of the second vortex chamber with all of the gas inlet and outlet passages terminating at the second vortex chamber.

The Examiner states that Kunio discloses a plurality of vortex chucks in an article holder. Kunio’s English Language Abstract describes only one “swirl-making chamber”, but we will assume for the sake of argument that Kunio discloses a plurality of such chambers.

Kunio does not disclose combining different geometries in a single holder as recited in Claim 1. The Examiner states:

... these features control the amount and location of pressure on the substrate and would need to be adjusted for implementing specific applications.

Applicant does not dispute that the chamber geometry may have to be adjusted, but Kunio does not disclose an adjustment involving a combination of different geometries in one holder as recited in Claim 1. There is no teaching in Kunio that controlling the “amount

and location of pressure on the substrate” may be facilitated by combining different geometries as suggested by the Examiner. See MPEP 2143 (the teaching or suggestion to make the claimed invention must be found “in the prior art”).

The Examiner states:

Making the elements adjustable has been held to be obvious.

Claim 1 does not recite that the vortex chambers are adjustable. It may be true that a vortex chamber may be adjusted by the designer, but the vortex chambers do not have to be adjustable once they are manufactured in the holder. Therefore, a holding on making the elements adjustable does not apply to Claim 1.¹

Claim 2 depends from Claim 1.

Claim 8 recites more vortex chuck outlets per unit area in one portion of the surface of an article holder than in another portion of the surface of the holder.

Kunio does not teach or suggest this feature. There is no indication in Kunio that controlling “the amount and location of pressure on the substrate” may be facilitated by different numbers of outlets per unit area as in Claim 8.

Claim 10 is believed to be allowable for similar reasons.

Claim 12 depends from Claim 10

Claim 21 is amended to recite an article holder in which one vortex chuck emits more gas per unit of time than another vortex chuck.

Kunio does not teach or suggest this feature.

Claims 3, 5, 7, 9, 11, 19-20 and 22-23 were rejected under 35 U.S.C. 103 over Kunio in view of Siniaguine.

Claims 3, 5, 7 depend from Claim 1, and are allowable at least for this reason. Of note, Siniaguine does not teach or suggest combining different geometries in a vortex holder

¹ Claim 1 is however sufficiently broad to cover adjustable elements.

and thus does not overcome the deficiency of Kunio discussed above in connection with Claim 1.

In addition, Claim 3 recites “rotating an article holder” around an axis, wherein “a minimum distance between said axis and the first vortex chamber is smaller than a minimum distance between said axis and the second vortex chamber”. The first and second vortex chambers are different in that “all of the one or more gas inlets terminating at the first vortex chamber have a larger combined cross-sectional area than all of the one or more gas inlets terminating at the second vortex chamber” (see Claim 2 from which Claim 3 depends).

Claim 3 is supported by Applicant’s specification, page 5, lines 2-3 and Fig. 2. In Fig. 2, chuck 202.1 is closer to axis 140X than chuck 202.2. The larger cross-sectional area of inlets 330, 340 of chuck 202.1 compensates for the smaller rotational cooling effect and provides more uniform overall wafer cooling.²

Kunio and Siniaguine do not teach or suggest the invention of Claim 3 and do not provide a motivation therefor.

Claim 5 is believed to be allowable for similar reasons. In addition, Claim 5 incorporates the language of Claim 4, which implies that the first gas vortex chamber has multiple gas inlets.

Kunio and Siniaguine do not teach or suggest a vortex chamber with multiple inlets.

Claim 9 depends from Claim 8, and is believed to be allowable for at least this reason. Siniaguine does not overcome the deficiency of Kunio discussed above in connection with Claim 8.

In addition, Claim 9 recites that “a minimum distance” between an axis of rotation and the “first” surface portion having more outlets per unit area “is smaller than a minimum distance between said axis and the second” surface portion. Claim 9 is believed to be allowable for reasons similar to the reasons given above for Claim 3.

² Claim 3 is not limited to the embodiments of Fig. 3 and page 5 or to their advantages.

Claim 11 depends from Claim 10, and is believed to be allowable for at least this reason. Siniaguine does not overcome the deficiency of Kunio discussed above in connection with Claim 10.

In addition, Claim 11 is believed to be allowable for reasons similar to the reasons given above for Claim 3.

Claims 19-20 depend from Claim 18, and will be discussed below.

Claims 22-23 depends from Claim 21, and are believed to be allowable for at least this reason. Siniaguine does not overcome the deficiency of Kunio discussed above in connection with Claim 21.

In addition, Claims 22-23 are believed to be allowable for reasons similar to the reasons given above for Claim 3.

Claims 18 and 24 were rejected under 35 U.S.C. 103 over Bollinger et al., U.S. patent no. 6,467,297.

Claim 18 recites an article holder having first and second vortex chambers constructed to be positioned opposite to respective first and second portions of an article. Claim 18 recites that the vortex chambers are arranged for greater cooling of the first portion by the one or more first vortex chambers than of the second portion by the one or more second vortex chambers. Claim 18 is re-worded to make clear that the “greater cooling” is a functional language describing a structural arrangement of the vortex chambers (MPEP 2173.05(g)) and not simply a manner of operating a device which itself may be prior art (MPEP 2114).

Bollinger shows vortex chucks 32 (Figs. 2, 3, 5) positioned opposite to different portions of substrate 22. Bollinger does not teach or suggest that his chucks may function to cool the respective different portions differently as recited in Claim 18. Therefore, the “greater cooling” language structurally distinguishes Claim 18 over Bollinger (MPEP 2114). Moreover, Bollinger does not provide a motivation for the different cooling as in Claim 18.

As stated above, **Claims 19-20** dependent from Claim 18 were rejected under 35 U.S.C. 103 over Kunio in view of Siniaguine. Kunio and Siniaguine are no more pertinent to Claim 18 than Bollinger.

In addition, Claims 19-20 are believed to be allowable for reasons similar to the reasons given above for Claim 3.

Claim 24 has been amended to recite first and second gas sources operable to cause a gas emitted from one or more first chambers to be colder than from one or more second chambers. This amendment is supported by Applicant's specification, page 5, lines 13-16.

Bollinger's Fig. 5 shows a "hollow shaft 56 feeding gas to ... vortex chucks 32" (Bollinger, column 6, lines 3-4). Bollinger does not teach or suggest that the shaft 56, or any other portion of his system, is operable to cause a gas emitted from some of his chucks 32 to be colder than from other chucks. Nor does Bollinger provide a motivation for such a structure.

Claims 25-26 were rejected under 35 U.S.C. 103 over Bollinger in view of Siniaguine. Claims 25-26 depend from Claim 24. Siniaguine does not cure the deficiency of Bollinger discussed above in connection with Claim 24.

In addition, Claims 25-26 are believed to be allowable for reasons similar to the reasons given above for Claim 3.

New Claims

Claims 27-30 are supported by Applicant's page 5, lines 13-16.

Claim 27 depends from Claim 24 and is allowable at least for that reason.

Claim 28 is allowable for reasons similar to the reasons given above for Claim 24.

Claims 29-30 depend from Claim 28. In addition, Claims 29-30 are believed to be allowable for reasons similar to the reasons given above for Claim 3.

Any questions regarding this case can be addressed to the undersigned at the telephone number below.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on December 19, 2003.

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